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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/796,201	03/10/2004	Noboru Segawa	086531-0136	2432

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EXAMINER	
MCCRACKEN, DANIEL	
ART UNIT	**PAPER NUMBER**
1793	

MAIL DATE	DELIVERY MODE
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/796,201	SEGAWA ET AL.	
	Examiner	Art Unit	
	DANIEL C. MCCRACKEN	1793	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *21 February 2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *4-21* is/are pending in the application.

4a) Of the above claim(s) *4-12* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *13-21* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Citation to the Specification will be in the following format: (S. # : ¶/L) where # denotes the page number and ¶/L denotes the paragraph number or line number. Citation to patent literature will be in the form (Inventor # : LL) where # is the column number and LL is the line number. Citation to the pre-grant publication literature will be in the following format (Inventor # : ¶) where # denotes the page number and ¶ denotes the paragraph number.

Response to Arguments

Applicant's arguments with respect to claims 1-3 have been considered but are moot in view of cancellation of Claims 1-3 and the new ground(s) of rejection *infra*.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 13 and 20 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

With respect to Claims 13 and 20, “deodorizing an odor” is recited, but no “deodorizing" step is claimed. Furthermore, the ozone is immediately destroyed, presumably before it can “deodorize” something.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

The references cited teach each and every limitation of the rejected claims. The pinpoint citations are in no way to be construed as limitations of the teachings of the reference, but rather illustrative of particular instances where the teachings may be found.

As to the third *Graham v. Deere* inquiry, resolving the level of ordinary skill in the art, the Examiner resolves the level to be high – presumably at minimum a bachelor's level chemical engineer with knowledge of catalysis and mass transfer. The skilled artisan would have experience in industries that employ catalysts, for example the automotive and air purification industries. Support for this finding can be found in any of the references of record, including Applicants' IDS. This finding was made once for brevity's sake, but to the extent it is necessary to support a rejection *infra*, it is expressly incorporated therein by reference.

Claims 13-16, 18 and 20-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. 5,676,913 to Cirillo, et al. in view of U.S. 5,538,697 to Abe,et al., U.S. 2002/0016252 to Takahashi, et al., U.S. 5,142,864 to Dunne, U.S. 5,497,619 to Yamada, et al., and Heck, et al., *The application for monoliths for gas phase catalytic reactions*, Chemical Engineering Journal 2001; 82: 149-156 (hereinafter "Heck at __").

With respect to Claims 13 and 18, Cirillo discloses the generation of ozone. (Cirillo 3: 48-57). Ozone "decomposing" necessarily occurs when it is passed through the catalytic bed disclosed by Cirillo. *See* (Cirillo 4: 11 *et seq*) (noting the same catalysts disclosed at S. 7: 9-15 *and* claimed). The catalysts and ozone of Cirillo are expected to behave the same as claimed. The same metals claimed are taught, and the same gasses claimed are taught. This is the evidence offered to show inherency. "[T]he PTO can require an applicant to prove that the prior art products do not necessarily or inherently possess the characteristics of his [or her] claimed product. Whether the rejection is based on inherency' under 35 U.S.C. 102, on prima facie obviousness' under 35 U.S.C. 103, jointly or alternatively, the burden of proof is the

same...[footnote omitted]." The burden of proof is similar to that required with respect to product-by-process claims. *In re Fitzgerald*, 619 F.2d 67, 70, 205 USPQ 594, 596 (CCPA 1980) (quoting *In re Best*, 562 F.2d 1252, 1255, 195 USPQ 430, 433-34 (CCPA 1977)). Furthermore, metals (i.e. catalysts) behave the same, regardless of who (Cirillo or Applicants) is using them. Carbon monoxide is oxidized in an oxidization section (Cirillo 3: 40-48). The housing shown in "Figs. 2-3" is being interpreted as a "common oxidizing reaction area"

To the extent Cirillo may be silent as to use of a "honeycomb structure" or a "three dimensional mesh structure," this does not impart patentability. Honeycomb structures have long been employed in gas treatment, and the Examiner takes official notice that they are so. In support of taking official notice (i.e. in making sure there is substantial evidence on the record), the Examiner cites to the following:

1. U.S. 5,538,697 to Abe,et al. – *see e.g.* (Abe "Abstract")
2. U.S. 2002/0016252 to Takahashi, et al. – *see e.g.* (Takahashi 1: [0005]).
3. U.S. 5,142,864 to Dunne – *see e.g.*(Dunne 2: 42) (honeycomb described as "preferred")
4. U.S. 5,497,619 to Yamada, et al. – *see e.g.* (Yamada 6: 35 *et seq*.)
5. Heck, et al., *The application for monoliths for gas phase catalytic reactions*, Chemical Engineering Journal 2001; 82: 149-156

Any number of teachings, suggestions or motivations can be gleaned from the prior art to substitute a honeycomb structure into the process of Cirillo. One of the more cogent comes from Heck, et al. *See e.g.* (Heck at 1, col. 2 ("This leads to one of the most important advantages of the monolith in that it has a large open frontal area resulting in very little resistance to flow and hence low pressure drop. The lower the pressure drop the lower the resistance to flow or back

pressure on the system and hence lower the energy loss."). Note that Heck is talking about honeycombs. *See* (Heck at 150, col. 2) ("honeycomb"). It is acknowledged that Heck - in a section conveniently entitled "Disadvantages of a monolith as a catalyst support," teaches some disadvantages. (Heck at 151, col. 1). That said, the Examiner considers the ability to control mass transfer and in turn the kinetics of the chemical reaction (i.e. what a chemical engineer or "one of ordinary skill in the art" does), as detailed by Heck, a more convincing rationale (teaching, suggestion, motivation, etc.) for utilizing a honeycomb structure. *See* (Heck at 152) (describing the relationship between mass transfer and reaction rate). Note that Heck discloses magnesia, alumina and silica. (Heck at 150, col. 1). Finally with respect to Claim 13, note the precious metals at (Cirillo 4: 23-24). As to Claim 18, note that Cirillo also teaches an alumina support. (Cirillo 4: 29).

As to Claim 14, Cirillo discloses discharge type ozone generators. (Cirillo 3: 55-57). As to Claim 15, duplication of parts (the discharge electrodes) does not impart patentability, absent some unexpected result. *In re Harza*, 274 F.2d 669, 124 USPQ 378 (CCPA 1960). As to Claim 16, a UV lamp is taught. *See e.g.* (Cirillo 4: 10).

With respect to Claim 20, to the extent this claim repeats limitations addressed above, the preceding discussion is relied upon. Note that Cirillo does teach a "flow path." *See* (Cirillo "Figs. 2-3") (note arrows indicate "flow"). As to Claim 21, suction and discharge ports are present. *See* (Cirillo 3: 29) ("inlet section") *and* (Cirillo 5: 26-32) ("the purified air is returned to the atmosphere" – i.e. through a discharge port). Note also "Fig. 2" It is expected – owing to the production of ozone (Cirillo 3: 55) – that any deodorizing phenomena is necessarily taught. Ozone behaves the same whether being harnessed by Cirillo or Applicants. See above with

respect to inherency and burden shifting. The "ozone decomposing" area is downstream of the ozone generating area. *See* (Cirillo "Fig. 2," items "5" and "8").

Claim 17 rejected under 35 U.S.C. 103(a) as being unpatentable over US 5,676,913 to Cirillo, et al., U.S. 5,538,697 to Abe,et al., U.S. 2002/0016252 to Takahashi, et al., U.S. 5,142,864 to Dunne, U.S. 5,497,619 to Yamada, et al., and Heck, et al., *The application for monoliths for gas phase catalytic reactions*, Chemical Engineering Journal 2001; 82: 149-156, as applied to claim14 above, and further in view of US 6,042,637 to Weinberg.

With respect to Claim 17, to the extent Cirillo, Abe, Takahashi, Dunne, Yamada or Heck may not disclose the "corona discharge" device as claimed, note that Cirillo discloses that any discharge device is suitable for producing ozone. (Cirillo 55-57). Weinberg teaches a corona discharge device that generates ozone. *See e.g.* (Weinberg "Abstract") ("*Corona discharge* at the emitter point ionizes the air and *creates ozone*, and nitric oxide both of which combine with direct electron impact decomposition to detoxify and destroy a wide variety of airborne pollutants including pathogens, chemicals and allergens.") (emphasis added). Substitution of ozone device for another (as taught by Cirillo – *see generally* 3: 50-67) is an obvious expedient to the skilled artisan.

Claim 19 rejected under 35 U.S.C. 103(a) as being unpatentable over US 5,676,913 to Cirillo, et al., U.S. 5,538,697 to Abe,et al., U.S. 2002/0016252 to Takahashi, et al., U.S. 5,142,864 to Dunne, U.S. 5,497,619 to Yamada, et al., and Heck, et al., *The application for*

monoliths for gas phase catalytic reactions, Chemical Engineering Journal 2001; 82: 149-156, as applied to claim 13 above, and further in view of US 4,661,468 to Lee, et al.

With respect to Claim 19, to the extent Cirillo, Abe, Takahashi, Dunne, Yamada or Heck may not disclose the particle size as claimed, utilizing a small catalyst particle does not impart patentability. Lee – like Cirillo - is generally drawn to a catalyst for treating exhaust. *See* (Lee 1: 14 *et seq.*). Lee provides an succinct discussion of the effect of catalyst diameter. *See* (Lee 2: 49 *et seq.*) (discussion the effect of particle size on surface area and, in turn, activity). Thus, there is a very clear teaching (or recognition) of the effect of catalyst size on catalytic activity. Optimizaiton of the size does not impart patentability. *In re Boesch*, 205 USPQ 215, 219 (CCPA 1980). That said, particle sizes within the claimed range are taught. *See* (Lee "Claim 6"). Note also that Lee teaches platinum/precious metal catalysts (Lee 1: 54 *et seq.*) and honeycomb carriers. (Lee 2: 32).

Claims 13-15, 18, and 20-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 5,221,520 to Cornwell in view of U.S. 5,538,697 to Abe,et al., U.S. 2002/0016252 to Takahashi, et al., U.S. 5,142,864 to Dunne, U.S. 5,497,619 to Yamada, et al., and Heck, et al., *The application for monoliths for gas phase catalytic reactions*, Chemical Engineering Journal 2001; 82: 149-156.

With respect to Claim 13, Cornwell discloses a method wherein ozone is generated (Cornwell 5: 67 *et seq.*), ozone is "decomposed" (Cornwell, col. 6), and CO is adsorbed/oxidized in a "ozone decomposing area." (Cornwell "Fig. 1," and 9: 4-9). The "ozone decomposing area"

contains an oxide of manganese (Cornwell 10: 18) and platinum (Cornwell 10: 36) (chloroplatinic acid treatment expected to deposit platinum). To the extent Cornwell does not teach the use of honeycombs, the Examiner adopts the analysis directed to honeycombs as set forth in the rejection over Cirillo, which is expressly incorporated herein by reference for brevity's sake. As to Claim 18, as noted above, Heck teaches magnesia, alumina and silica. (Heck at 150, col. 1). Substitution of one substrate/carrier for another is on obvious expedient to one of ordinary skill in the art. As to Claim 14, Cornwell teaches discharge type ozone generators. (Cornwell 8: 8-9). As to Claim 15, duplication of parts (the discharge electrodes) does not impart patentability, absent some unexpected result. *In re Harza*, 274 F.2d 669, 124 USPQ 378 (CCPA 1960).

With respect to Claim 20, to the extent this claim repeats limitations discussed above, the preceding discussion is relied upon. Note that teaches a zeolite. (Cornwell 9: 7). As to Claim 21, note the inlets and outles. (Cornwell 7: 65-68). Cornwell teaches the "decomposing area" downstream of the "ozone generating" area. *See* (Cornwell "Fig. 1") (items "20" and "26").

Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over US 5,221,520 to Cornwell, U.S. 5,538,697 to Abe,et al., U.S. 2002/0016252 to Takahashi, et al., U.S. 5,142,864 to Dunne, U.S. 5,497,619 to Yamada, et al., and Heck, et al., *The application for monoliths for gas phase catalytic reactions*, Chemical Engineering Journal 2001; 82: 149-156 as applied to claim 13 above, and further in view of US 5,676,913 to Cirillo, et al.

With respect to Claim 15, Cornwell describes any number of ozone generators as suitable. (Cornwell 8: 1-12). To the extent Cornwell may not teach UV lamps, Cirillo does. (Cirillo 3: 50-53). Substitution of one for the other is an obvious expedient to the skilled artisan.

Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over US 5,221,520 to Cornwell, U.S. 5,538,697 to Abe,et al., U.S. 2002/0016252 to Takahashi, et al., U.S. 5,142,864 to Dunne, U.S. 5,497,619 to Yamada, et al., Heck, et al., *The application for monoliths for gas phase catalytic reactions*, Chemical Engineering Journal 2001; 82: 149-156, and US as applied to claim 14 above, and further in view of US 6,042,637 to Weinberg.

With respect to Claim 17, to the extent Cornwell, Abe, Takahashi, Dunne, Yamada or Heck may not disclose the "corona discharge" device as claimed, note that Cornwell discloses that any discharge device is suitable for producing ozone. (Cornwell 8: 1-12). Weinberg teaches a corona discharge device that generates ozone. *See e.g.* (Weinberg "Abstract") ("*Corona discharge* at the emitter point ionizes the air and *creates ozone*, and nitric oxide both of which combine with direct electron impact decomposition to detoxify and destroy a wide variety of airborne pollutants including pathogens, chemicals and allergens.") (emphasis added). Substitution of ozone device for another (as taught by Cornwell – *see generally* 8: 1-12) is an obvious expedient to the skilled artisan.

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Claim 19 rejected under 35 U.S.C. 103(a) as being unpatentable over US 5,221,520 to Cornwell, U.S. 5,538,697 to Abe,et al., U.S. 2002/0016252 to Takahashi, et al., U.S. 5,142,864 to Dunne, U.S. 5,497,619 to Yamada, et al., and Heck, et al., *The application for monoliths for*

gas phase catalytic reactions, Chemical Engineering Journal 2001; 82: 149-156, as applied to claim 13 above, and further in view of US 4,661,468 to Lee, et al.

With respect to Claim 19, to the extent Cornwell, Abe, Takahashi, Dunne, Yamada or Heck may not disclose the particle size as claimed, utilizing a small catalyst particle does not impart patentability. Lee – like Cornwell - is generally drawn to a catalyst for treating exhaust. *See* (Lee 1: 14 *et seq.*). Lee provides an succinct discussion of the effect of catalyst diameter. *See* (Lee 2: 49 *et seq.*) (discussion the effect of particle size on surface area and, in turn, activity). Thus, there is a very clear teaching (or recognition) of the effect of catalyst size on catalytic activity. Optimizaiton of the size does not impart patentability. *In re Boesch*, 205 USPQ 215, 219 (CCPA 1980). That said, particle sizes within the claimed range are taught. *See* (Lee "Claim 6"). Note also that Lee teaches platinum/precious metal catalysts (Lee 1: 54 *et seq.*) and honeycomb carriers. (Lee 2: 32).

Conclusion

All amendments made in response to this Office Action must be accompanied by a pinpoint citation to the Specification (i.e. page and paragraph or line number) to indicate where Applicants are drawing their support.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to DANIEL C. MCCRACKEN whose telephone number is (571)272-6537. The examiner can normally be reached on Monday through Friday, 9 AM - 6 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stanley S. Silverman can be reached on (571) 272-1358. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Daniel C. McCracken/
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Examiner, Art Unit 1793
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/Stuart Hendrickson/
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